

Appln No. 10/622,221
Amdt date February 9, 2011
Reply to Office action of November 9, 2010

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please amend claims 1 and 17.

1. (Currently Amended) A catheter for ablating tissue, the catheter comprising:
an elongated generally-tubular catheter body having proximal and distal ends; and
an electrode assembly at the distal end of the catheter body, the electrode assembly including a porous electrode arrangement that is generally transverse to the catheter body, the porous electrode arrangement comprising:

a non-conductive tubing mounted on the distal end of the catheter, a mid-section of the non-conductive tubing having shape-memory such that the mid-section of the tubing is biased into a pre-formed generally heel-shaped curve comprising a first bend away from a first central longitudinal axis of the catheter body and a second bend distal the first bend back toward and past the first central longitudinal axis of the catheter body, wherein the non-conductive tubing terminates in a generally straight distal end having a second central longitudinal axis that is generally transverse to the first central longitudinal axis of the catheter body and having a free distal end, the second central longitudinal axis of the generally straight distal end forming an angle with the first central longitudinal axis of the catheter body ranging from about 75° to about 110°;

a single, continuous coiled electrode wrapped around at least a portion of the non-conductive tubing, the single, continuous coiled electrode being electrically connectable to a suitable energy source;

a porous sleeve mounted in surrounding relation to the coiled electrode and defining an open space between the porous sleeve and the coiled electrode; and

one or more irrigation openings fluidly connecting the open space to a lumen extending through the catheter through which fluid can pass;

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wherein, in use, fluid passes through the lumen in the catheter, through the one or more irrigation openings, into the open space and through the porous sleeve.

2. (Previously Presented) The catheter according to claim 1, wherein the non-conductive tubing includes at least one lumen fluidly connected to the lumen in the catheter body and to the one or more irrigation openings.

3. (Canceled).

4. (Original) The catheter according to claim 2, wherein the porous sleeve has proximal and distal ends that are bonded to the non-conductive tubing.

5. (Canceled).

6. (Canceled).

7. (Canceled).

8. (Canceled).

9. (Original) The catheter according to claim 1, wherein the porous sleeve comprises expanded polytetrafluoroethylene.

10. (Original) The catheter according to claim 1, wherein the porous sleeve comprises expanded polytetrafluoroethylene that is expandable to no more than 10% at a distilled water flow rate of 30 to 40 cc/min.

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11. (Original) The catheter according to claim 1, wherein the porous sleeve comprises a material selected from the group consisting of porous nylon, sintered ceramics, woven meshes and cellular foam.

12. (Previously Presented) The catheter according to claim 1, wherein the porous electrode arrangement has a length ranging from about 10 to about 25 mm.

13. (Previously Presented) The catheter according to claim 1, wherein the porous electrode arrangement has a length ranging from about 10 to about 15 mm.

14. (Previously Presented) The catheter according to claim 1, wherein the electrode assembly further comprises one or more ring electrodes mounted proximal and/or distal to the porous electrode arrangement.

15. (Original) The catheter according to claim 1, wherein the electrode assembly further comprises one or more temperature sensors.

16. (Original) The catheter according to claim 15, wherein the one or more temperature sensors are mounted under the porous sleeve.

17. (Currently Amended) A catheter for ablating tissue, the catheter comprising:
an elongated generally-tubular catheter body having proximal and distal ends; and
an electrode assembly at the distal end of the catheter body, the electrode assembly comprising:

a non-conductive tubing mounted on the distal end of the catheter body having a lumen extending therethrough, the non-conductive tubing having shape-memory such that the tubing is biased into a pre-formed generally heel-shaped curve comprising a first bend away from a first central longitudinal axis of the catheter body and a second bend distal the first bend

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back toward and past the first central longitudinal axis of the catheter body, wherein the non-conductive tubing terminates in a generally straight distal end having a second central longitudinal axis that is generally transverse to the first central longitudinal axis of the catheter body and having a free distal end, the second central longitudinal axis of the generally straight distal end of the non-conductive tubing forming an angle with the first central longitudinal axis of the catheter body ranging from about 75° to about 110°; and

a generally-straight porous electrode mounted on the generally straight distal end of the non-conductive tubing and being generally transverse to the first central longitudinal axis of the catheter body, the porous electrode comprising:

a single, continuous coiled electrode wrapped around at least a portion of the non-conductive tubing, the single, continuous coiled electrode being electrically connectable to a suitable energy source;

a porous sleeve mounted in surrounding relation to the coiled electrode and defining an open space between the porous sleeve and the coiled electrode; and

one or more irrigation openings fluidly connecting the open space to the lumen extending through the non-conductive tubing.

18. (Canceled).

19. (Original) The catheter according to claim 17, wherein the porous sleeve has proximal and distal ends that are bonded to the non-conductive tubing.

20. (Canceled).

21. (Canceled).

22. (Original) The catheter according to claim 17, wherein the porous sleeve comprises expanded polytetrafluoroethylene.

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23. (Original) The catheter according to claim 17, wherein the porous sleeve comprises expanded polytetrafluoroethylene that is expandable to no more than 10% at a distilled water flow rate of 30 to 40 cc/min.

24. (Original) The catheter according to claim 17, wherein the porous sleeve comprises a material selected from the group consisting of porous nylon, sintered ceramics, woven meshes and cellular foam.

25. (Previously Presented) The catheter according to claim 17, wherein the porous electrode arrangement has a length ranging from about 10 to about 25 mm.

26. (Previously Presented) The catheter according to claim 17, wherein the porous electrode arrangement has a length ranging from about 10 to about 15 mm.

27. (Previously Presented) The catheter according to claim 17, wherein the electrode assembly further comprises one or more ring electrodes mounted proximal and/or distal to the porous electrode arrangement.

28. (Original) The catheter according to claim 17, wherein the electrode assembly further comprises one or more temperature sensors.

29. (Original) The catheter according to claim 28, wherein the one or more temperature sensors are mounted under the porous sleeve.

30. (Previously Presented) The catheter according to claim 28, further comprising a pre-shaped support wire extending through a second lumen in the non-conductive tubing, wherein the support wire is fixedly anchored in the non-conductive tubing.

31. (Original) The catheter according to claim 30, wherein the pre-shaped support wire comprises nitinol.

32. (Original) The catheter according to claim 17, wherein the one or more irrigation openings are located only on the side of the porous electrode that is to be in contact with tissue to be ablated.

33. (Withdrawn) A method for ablating heart tissue comprising inserting the distal end of a catheter according to claim 1 into the heart of a patient and forming at least one linear lesion in the atrial tissue with the porous electrode by simultaneously supplying ablation energy to the one or more electrodes and introducing fluid through the irrigation openings so that the fluid passes through the porous sleeve.

34. (Withdrawn) A method for treating atrial fibrillation comprising inserting the distal end of a catheter according to claim 1 into an atrium of the heart of a patient and forming at least one linear lesion in the atrial tissue with the porous electrode by simultaneously supplying ablation energy to the one or more electrodes and introducing fluid through the irrigation openings so that the fluid passes through the porous sleeve.